REMARKS

Claims 1-18 and 22-23 are pending in the present application. By this response, reconsideration of the claims is respectfully requested.

I. Objection to Drawings

The examiner objects to the drawings under 37 CFR 1.83(a). In particular, the examiner states:

> The drawings must show every feature of the invention specified in the claims. Therefore, the common connection between the first and second connections of claim 2 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

(*Office Action*, dated August 13, 2003, page 2).

However, the common connection between the first and second connections of claim 2 is clearly shown in **Figures 4-13** of the present invention. For example, **Figure 5** is reproduced below:

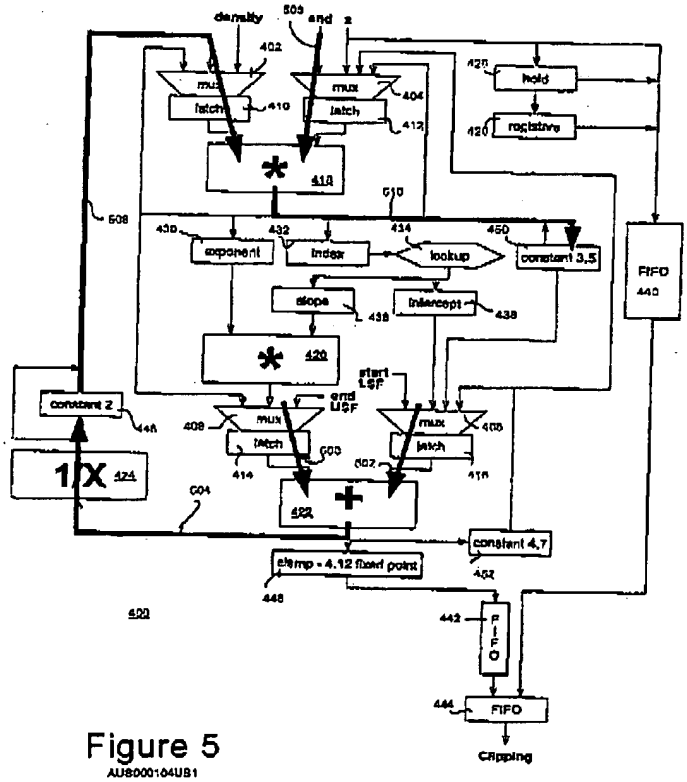

Figure 5
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As shown in **Figure 5**, addition unit **422** and reciprocal unit **424** are configured by the first set of connections to generate constant2 **448**. Multiplexer units **402, 404** and multiplication unit **418** are configured by the second set of connections. Multiplexer units **402, 404** select variable End and constant2 **448** (generated from the first set of connections). Multiplication unit **418** multiplies the values selected by multiplexer units **402, 404** to generate constant3 **450**. The common connection is illustrated by flow **506**, where two sets of connections are connected.

Thus, applicants respectfully submit that the drawings show every feature of the invention as specified in dependent claim 2. Accordingly, applicants respectfully request withdrawal of the objections under 37 CFR 1.83(a).

II. 35 U.S.C. § 103(a), Alleged Obviousness, Claims 1-18

The examiner rejects claims 1-18 under 35 U.S.C. § 103(a) as being unpatentable over *Lindholm et al.* (U.S Patent No. 6,198, 488) in view of *Wood et al.* (U.S. Patent No. 6,028,590). This rejection is respectfully traversed.

With regard to claim 1, the examiner states:

> Lindholm et al discloses a plurality of logic units (fig 1A), wherein the plurality of logic units are used to perform a graphics operation in which a set of constants is required for the graphics operation (column 3, lines 65-67 and column 4, lines 1-7); a first set of connections connecting the plurality of logic units to each other (fig 1A). However, Lindholm et al does not disclose wherein the first set of connections are used to configure the plurality of logic units to determine the set of constants; and a second set of connections connecting the plurality of logic units, wherein the second set of connections configure the plurality of logic units to perform the graphics operation in which the graphics operation using the constants is determined through the first set of connections.
>
> Wood et al. discloses determining constants for a logic unit (color conversion) and using the constants with the logic unit (color conversion, column 1 lines 35-50). It would have been obvious to one of ordinary skill in the art at the time the invention was made to generate the constants as in Wood et al with the system of Lindholm et al because generating the constants when needed obviates the need for a look up table. Although, neither Lindholm et al or Wood et al disclose the logic units with two connections, Lindholm et al shows only one connection in fig 1A, therefore generating the constants and using them are done thru one connection only, so using two connections just takes up more circuitry and does not make it patentably distinct. (emphasis added)

(*Office Action*, dated August 13, 2003, pages 2-3). Independent claim 1, which is representative of independent claim 10, reads as follows:

> 1. An apparatus for optimizing processing of graphics data, the apparatus comprising:
> a plurality of logic units, wherein the plurality of logic units are used to perform a graphics operation in which a set of constants is required for the graphics operation;
> a first set of connections connecting the plurality of logic units to each other, wherein the first set of connections are used to configure the plurality of logic units to determine the set of constants; and
> a second set of connections connecting the plurality of logic units, wherein the second set of connections configure the plurality of logic units to perform the graphics operation in which the graphics operation using the constants is determined through the first set of connections. (emphasis added)

Neither *Lindholm* nor *Wood*, either alone or in combination, teaches or suggests the features of claim 1 emphasized above. *Lindholm* teaches a graphics pipeline system for graphics processing, which includes a transform module adapted for being coupled to a vertex attribute buffer (VAB) for receiving attribute data. The transform module transforms the vertex data from object space to screen space. A lighting module is coupled to the transform module for performing lighting operations on the vertex data received from the transform module. A rasterizer is also coupled to the lighting module for rendering vertex data received from the lighting module (*Lindholm*, Abstract).

Wood teaches a method of color conversion, which includes steps of generating constants from a number of points, spacing and an endpoint for YUV point spacing, adding a constant to a value representing image data to clamp the value towards a predetermined maximum range of image points, subtracting a second constant from the resulting sum value to clamp the sum value towards a predetermined minimum range representing points in an image graph, shifting the resulting difference using spacing information to generate a value for Y, U, V values, and combining the resultant Y, U, V values and combining the resultant Y, U, V values to generate palette indexes to represent given image data (*Wood*, Abstract).

However, neither *Lindholm* nor *Wood* teaches or suggests configuring logic units to determine the set of constants. The examiner alleges that the features of claim 1 are taught by *Wood* in the following portion of the reference:

> A method for color conversion is disclosed. The method includes the steps of generating constants from a number of points, spacing and an endpoint for YUV point spacing, adding a constant to a value representing image data to clamp the value towards a predetermined maximum range of image points, subtracting a second constant from the resulting sum value to clamp the sum value towards a predetermined minimum range representing points in an image graph, shifting the resulting difference using spacing information to generate a value for Y, U, V values, and combining the resultant Y, U, V values to generate palette indexes to represent given image data.

(*Wood*, column 1, lines 35-50).

Neither the cited section above nor or any other section in *Wood* teaches or suggests configuring logic units to determine the set of constants. *Wood* merely teaches a method to generate constants using a color converter, rather than teaching the color converter as a logic unit. For example, *Wood* recites:

> A compressed video file, comprises instructions for a decoder and a color converter all reside in the storage device....The color converter converts the YUV data into palette indexes.

(*Wood*, column 2, lines 19-26).

The color converter of *Wood* is merely software instructions that converts the YUV data generated by the decoder into palette indexes. In addition, *Wood* teaches these software instructions of generating palette indexes from the YUV data in further detail in Figure 4. Therefore, *Wood* teaches using software instructions to generate the constants, as opposed configuring logic units (hardware) to determine the set of constants.

Furthermore, neither *Lindholm* nor *Wood* teaches or suggests configuring the plurality of logic units to perform the graphics operation as recited in independent claim 1 of the present invention. As described above, *Wood* only teaches using software instructions stored in the storage device to perform graphics operations, rather than teaching configuring logic units (hardware) to perform graphics operations. Therefore, *Wood* does not each and every feature as recited in claim 1.

Wood actually teaches away from the presently claimed invention because it teaches using software instructions stored in the storage device to generate the constants as opposed to configuring logic units (hardware) to determine the set of constants as in the presently claimed invention. Absent the Examiner pointing out some teaching or incentive to implement *Wood* and using logic units to determine the set of constants, one of ordinary skill in the art would not be led to modify *Wood* to reach the present invention when the reference is examined as a whole. Absent some teaching, suggestion, or incentive to modify *Wood* in this manner, the presently claimed invention can be reached only through an improper use of hindsight using the Applicants' disclosure as a template to make the necessary changes to reach the claimed invention.

In addition to the above, the examiner states:

> Although neither Lindholm or Wood disclose the logic units with two connections, Lindholm shows only one connection in fig 1A, therefore generating the constants and using them are done thru one connection only, so using two connections just takes up more circuitry and does not make it patentably distinct.

(Office Action, dated August 13, 2003, page 3).

The second set of connections, as recited in claim 1, is used to configure logic units to perform graphics operations. It is different from the first set of connections in that a set of constants has to be first determined using logic units configured by the first set of connections before the graphics operation can be performed using logic units configured by the second set of connections. Thus, the first and second set of connections serves different purposes in configuring the logic units to perform different functions. The two sets of connections may not be used as one connection. Hence, using two sets of connections is necessary in order to configure the logic units to perform the proper functions, and such arrangement makes the present invention patentably distinct.

Thus, in view of the above, neither *Lindholm* nor *Wood*, either alone or in combination, teaches or suggests the features of independent claims 1 and 10. At least by virtue of their dependency on claim 1 and 10, respectively, neither reference, either alone or in combination, teaches or suggests the features of dependent claims 2-9, 11-18. Accordingly, the rejection of claims 1-18 under 35 U.S.C. § 103(a) has been overcome.

III. 35 U.S.C. § 103(a), Alleged Obviousness, Claims 22-23

The examiner rejects claims 1-18 under 35 U.S.C. § 103(a) as being unpatentable over *Lindholm et al.* (U.S Patent No. 6,198, 488) in view of *Wood et al.* (U.S. Patent No. 6,028,590) in further in view of *Rohner* (U.S. Patent No. 6,064,392). This rejection is respectfully traversed.

With regard to independent claim 22, the examiner states:

> Lindholm does not disclose in which the set of logic units is used to perform an operation on the graphics data using an equation and wherein a portion of the set of logic units is used to determine at least one constant for the equation used in the operation. This is disclosed in Wood et al in column 1 lines 30-50. It would have been obvious to one of ordinary skill in the art at the time the invention was made to determine constants with the system of Lindholm because generating the constants when needed obviates the need for a look up table. Also, Lindholm does not specifically mention frame buffers with raster engine. This is disclosed in Rohner in column 4, lines 29-35. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use frame buffer with the system of Lindholm et al because Rohner also uses constants with graphic operations which could be animations or anything that requires frames which would require frame buffers.

(*Office Action*, dated August 13, 2003, page 6). Independent claim 22, reads as follows:

> 22. A graphics adapter comprising:
> an input configured to receive graphics data;
> a frame buffer, wherein processed graphics data is stored for display;
> a raster engine connected to the input and to the frame buffer, wherein the raster engine rasterizes the processed graphics data for display,
> a geometry engine connected to the raster engine, wherein the geometry engine receives graphics data from the raster engine, processes the graphics data to form the processed graphics data, and returns the processed graphics data to the raster engine and wherein the geometry engine includes a set of processing elements in which at least one processing element within the set of processing elements includes a set of logic units, in which the set of logic units is used to perform an operation on the graphics data using an equation and wherein a portion of the set of logic units is used to determine at least one constant for the equation used in the operation. (emphasis added)

Lindholm, *Wood*, and *Rohner* do not teach or suggest using a set of logic units to determine at least one constant for the equation used in the operation on the graphics data as recited in claim 22. *Wood* teaches using software instructions to generate a constant

(col. 1, lines 30-50), rather than teaching using logic units (hardware) to determine at least one constant for the equation. Since *Wood* does not teach the use of logic units, it would not be obvious for a person of ordinary skill in the art to either modify or combine the system of *Lindholm* and *Wood* to determine a constant using logic units.

In addition, the examiner alleges that *Rohner* teaches a frame buffer for storing processed graphics data for display, in the following portion of this reference:

> In an alternative embodiment, a 24 bit fog register is used with an (8,8,8) register format. Fog register can be updated at the beginning of a new frame. Fog mixer computes the fogged color for the pixels covered by the polygon. The fogged color (R,G,B)mix is a weighted mix of the computed pixel color (R,G,B)polygon with the fog color (R,G,B)fog, according to the pixel visibility value provided by the visibility compute logic unit.

(*Rohner*, column 4, lines 29-35).

Neither the section above, nor any other section of *Rohner*, teaches or suggests a frame buffer for storing processed graphics data for display. *Rohner* only teaches a fog register used to store RGB values used by the fog mixer for computing the fogged color, as opposed to storing processed graphics data for display. Nowhere in the above cited section even mention a frame buffer for storing processed graphics data. In addition, the fog register of *Rohner* is a hardware register, as opposed to the frame buffer of the present invention, which is an area of memory in the graphics adapter. (3)

In view of the above, *Lindholm*, *Wood*, and *Rohner*, alone or in combination, fail to teach or suggest the features recited in claim 22. At least by virtue of its dependency on claim 22, *Lindholm*, *Wood*, nor *Rohner*, alone or in combination, fail to teach or suggest the features of dependent claim 23. Accordingly, the rejection of claim 22 and 23 under 35 U.S.C. § 103(a) has been overcome.

IV. Conclusion

It is respectfully urged that the subject application is patentable over the cited references and is now in condition for allowance. The examiner is invited to call the undersigned at the below-listed telephone number if in the opinion of the examiner such a telephone conference would expedite or aid the prosecution and examination of this application.

Respectfully submitted,

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